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NBS

PUBLICATIONS

NBSIR 82-1673

BIBLIOGRAPHY OF THE NBS ELECTROMAGNETIC FIELDS DIVISION PUBLICATIONS

Edited by
Kathryn A. Gibson
Charles K. S. Miller

National Bureau of Standards
U.S. Department of Commerce
Boulder, CO 80303

August 1982

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National Engineering Laboratory
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U.S. DEPARTMENT OF COMMERCE, Malcolm Baldrige, Secretary

NATIONAL BUREAU OF STANDARDS, Ernest Ambler, Director

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A BIBLIOGRAPHY OF THE NBS ELECTROMAGNETIC FIELDS DIVISION PUBLICATIONS

Edited by
Kathryn A. Gibson and Charles K. S. Miller

This bibliography lists the publications of the personnel of the NBS Electromagnetic Fields Division in the period from January 1980 through December 1981.

Key words: antennas; electromagnetic interference; em material properties; electromagnetic metrology; microwaves; noise; non-ionizing radiation; radiation hazards.

INTRODUCTION

This bibliography updates and supplements NBSIR 80-1635 which lists the publications of the Electromagnetic Fields Division from January 1970 to December 1979. The publications listed in this supplement were published in 1980 and 1981.

The Electromagnetic Fields Division was formed during the reorganization of NBS in April 1978. The Division develops measurement methods and standards, and provides metrological support for: antenna systems, noise measurement equipment, electromagnetic interference, electromagnetic environmental characterization equipment especially for near fields to sources or a near-field like condition, electromagnetic emission and immunity (or susceptibility) testing equipment, and for measuring equipment used for dielectric or loss characterization of materials. The editors have attempted to include all work published by the staff members of the Division, in the period from January 1980 through December 1981. There are a few exceptions. Relevant work performed by authors prior to joining this Division or work by authors who have left this Division has been included because of its special significance. A miscellaneous category includes general publications. A few references are listed in more than one category where appropriate.

There are several other information sources that may be useful to the reader who is interested in activities at NBS connected with electromagnetic metrology. Companion bibliographies list publications of the Electromagnetic Technology Division. Its topics include metrology for: microwave circuits, laser systems, optical communication equipment, systems using transient or pulsed electromagnetic phenomena, cryoelectronics, superconductors and other unusual electrical engineering materials. Three bibliographies of the publications of the former Electromagnetics Division have been published: NBSIR 73-320 (July 1972-June 1973); NBSIR 74-395 (July 1973-June 1974); NBSIR 75-818 (July 1974-June 1975). These were preceded by a series of unpublished reports (edited by H. M. Altschuler) that cover the period back to 1956. An excellent summary of the whole field of electromagnetic metrology as it stood in 1967 was published as a special issue of the IEEE Proceedings (volume 55, June 1967). Advances in the following decade were described in another special issue of the same journal (volume 66, April 1978).

A NOTE ON ABBREVIATIONS

Most readers will be familiar with the commonly used abbreviations for the names of the various professional journals that appear in this bibliography. There are also several publication series that are peculiar to NBS and call for explanation. They are:

NBSIR	-	NBS Interagency/Internal Report
NBS-TN	-	NBS Technical Note
NBS-SP	-	NBS Special Publication
NBS-MN	-	NBS Monograph

Purchase Procedures and Document Availability

NBS Technical Notes and Special Publications may be purchased from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. Orders must be accompanied by postal money order, express money order, or check made out to the Superintendent of Documents.

NBS Interagency/Internal Reports (NBSIR's) may be purchased from the National Technical Information Service, Springfield VA 22161. Order must be accompanied by postal money order, express money order, or check made out to the NTIS.

Reprints of papers published in non-NBS media may be available in limited quantities from the authors.

Microwave Antenna Measurement Services at the National Bureau of Standards

Baird, R. C.
Digest, Antenna Meas. Tech. Assn. Mtg.
Oct. 1981

Broadband Orthogonal Array Antenna System: Microprocessor Control and Computation

Bensema, W. D.
Record, EMC '81
Aug. 1981

Optimized Wavelength-Sized Scalar Horns as Antenna Radiation Standards

Estin, A. J.; Stubenrauch, C. F.; Repjar, A. G.; and Newell, A. C.
1981 EEMTIC Digest
June 1981

The Characteristics of a Linear Antenna with Tapered Resistive and Capacitive Loading

Kanda, M.
Proc., IEEE AP Symp., Quebec, Canada
June 2-6, 1980, Vol. 2, AP-18-2, pp 696-699

The Time Domain Characteristics of a Traveling Wave Linear Antenna with Linear and Non-Linear Loads

Kanda, M.
IEEE Trans. Ant. & Prop.
March 1980, Vol. AP-28, No. 2

Analytical and Numerical Techniques for Analyzing an Electrically Short Dipole with a Nonlinear Load

Kanda, M.
IEEE Trans. Ant. & Prop.
Jan. 1980, Vol. AP-28, No. 1, pp 71-78

Transients in Resistively Loaded Antennas and Their Comparison with Conical Antennas and a TEM Horn

Kanda, M.
IEEE Trans. Ant. & Prop.
Jan. 1980, Vol. AP-28, No. 1, pp 132-136

Plane-Wave Scattering-Matrix Theory of Antennas and Antenna-Antenna Interactions

Kerns, D. M.
NBS Monograph 162
June 1981

Spherical-Wave Source-Scattering-Matrix Analysis of the Mutual Coupling Between Two Antennas

Lewis, R. L.
Digest, 1981 IEEE/AP-S Int'l Symp.
June 1981

Efficient Computation of the Far Field Radiated by an Arbitrary Rectangular-Aperture Distribution

Lewis, R. L.
NBSIR 81-1643
April 1981

Synthesis of Broadband Antenna Arrays as Possible Over-the-Horizon Radars

Ma, M. T.
Book, "Research Topics in EM Wave Theory" (John Wiley Interscience)
1981, Chapter 9

Synthesized Isotropic Pattern Antennas for EM Field Measurements

Reeve, G. R.
Symp. Record, "EMC '81," 1981 IEEE Int'l Symp. on Electromagnetic
Compatibility, Boulder, CO, Aug. 18-20, 1981
Aug. 1981

A Frequency Tracking, Tuned, Receiving Monopole

Reeve, G. R. and Wainwright, A. E.
Record, IEEE/APS Symp.
June 1981

Results of Planar Near-Field Measurements on a Compact Range at 18 and 54 GHz

Repjar, A. G. and Kremer, D. P.
Digest, 1980 IEEE/AP-S Symposium

Determination of Mutual Coupling Between Co-Sited Microwave Antennas and
Calculation of Near-Zone Electric Field

Stubenrauch, C. F. and Yaghjian, A. D.
NBSIR 81-1630
June 1981

Fields of a Horizontal Loop of Arbitrary Shape Buried in a Two-Layer Earth

Wait, J. R. and Hill, D. A.
Radio Science
Sep.-Oct. 1980, Vol. 15, No. 5, pp 903-912

A Delta-Distribution Derivation of the Electric Field in the Source Region

Yaghjian, A. D.
Digest, 1981 IEEE/AP-S Int'l Symp.
June 1981

An Approximate Expression for the Principal Beamwidths of Directive Antennas in
Terms of Aperture Fields

Yaghjian, A. D.
NBSIR 81-1644
March 1981

Electromagnetic Interference

Broadband Orthogonal Array Antenna System: Microprocessor Control and Computation

Bensema, W. D.
Record, EMC '81
Aug. 1981

A Temperature Probe for Radio-Frequency Heated Material

Bowman, R. R.
NBSIR 81-1634
Jan. 1981

Requirements for an Effective National Nonionizing Radiation Measurement System

Clark, H. E.
NBS Special Pub. 613
June 1981

Options to Open-Field and Shielded Enclosure Electromagnetic Compatibility Measurements

Crawford, M. L.
Proc., Int'l EMC Symp., Zurich, Switzerland, March 10-12, 1981
March 1981

Evaluation of a Reverberation Chamber Facility for Performing EM Radiated Fields Susceptibility Measurements

Crawford, M. L.
NBSIR 81-1638
Feb. 1981

Predicting Free-Space Radiated Emissions from Electronic Equipment Using TEM Cell and Open-Field Site Measurements

Crawford, M. L. and Workman, J. L.
Record, 1980 Int'l EMC Symposium

Spherical Dipole for Radiating Standard Fields

Crawford, M. L. and Workman, J. L.
Digest 1980 CPEM Conf.
June 1980

Design, Construction, and Calibration of the Broadband Electric Field Monitor (EFM-5)

Cruz, J. E.
Symp. Record, "EMC '81," 1981 IEEE Int'l Symp. on Electromagnetic Compatibility, Boulder, CO, Aug. 18-20, 1981
Aug. 1981

Free-Space Transmission Loss for Anechoic Chamber Performance Evaluation

FitzGerrell, R. G.
Symp. Record, "EMC '81," 1981 IEEE Int'l Symp. on Electromagnetic Compatibility, Boulder, CO, Aug. 18-20, 1981
Aug. 1981

Electromagnetic Characteristics of a Coaxial Cable with Periodic Slots

Hill, D. A. and Wait, J. R.

IEEE Trans. on EMC

Nov. 1980, Vol. EMC-22, No. 4, pp 303-307

Propagation Along a Coaxial Cable with a Helical Shield

Hill, D. A. and Wait, J. R.

IEEE Trans. on MTT

Feb. 1980, Vol. MTT-28, No. 2, pp 84-89

A Broadband, Isotropic, Real-Time, Electric-Field Sensor (BIRES) Using Resistively Loaded Dipoles

Kanda, M.; Ries, F. X.; and Belsher, D. R.

IEEE Trans. EMC

Aug. 1981, Vol. EMC-23, No. 3

Theoretical and Experimental Investigations of Electromagnetic Field Distortion Due to a Perfectly Conducting Rectangular Cylinder in a Transverse Electromagnetic Cell

Kanda, M.

NBS Tech. Note 1028

April 1981

Theoretical and Experimental Investigations of Loading Effects Due to a Perfectly Conducting Rectangular Cylinder in a Transverse Electromagnetic Cell

Kanda, M.

4th Symp. and Tech. Exhib. on EMC, Zurich, Switzerland

March 1981

The Characteristics of a Linear Antenna with Tapered Resistive and Capacitive Loading

Kanda, M.

Proc., IEEE AP Symp., Quebec, Canada

June 2-6, 1980, Vol. 2, AP-18-2, pp 696-699

The Time Domain Characteristics of a Traveling Wave Linear Antenna with Linear and Non-Linear Loads

Kanda, M.

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March 1980, Vol. AP-28, No. 2

Analytical and Numerical Techniques for Analyzing an Electrically Short Dipole with a Nonlinear Load

Kanda, M.

IEEE Trans. Ant. and Prop.

Jan. 1980, Vol. AP-28, No. 1, pp 71-78

Transients in Resistively Loaded Antennas and Their Comparison with Conical Antennas and a TEM Horn

Kanda, M.

IEEE Trans. Ant. and Prop.

Jan. 1980, Vol. AP-28, No. 1, pp 132-136

Electromagnetic Interference (Cont'd)

Background and Present Status of RF Probe Development at NBS

Larsen, E. B.

Symp. Record, "EMC '81," 1981 IEEE Int'l Symp. on Electromagnetic Compatibility, Boulder, CO, Aug. 18-20, 1981
Aug. 1981

Design and Calibration of the NBS Isotropic Electric-Field Monitor (EFM-5), 0.2 to 1000 MHz

Larsen, E. B. and Ries, F. X.

NBS Tech. Note 1033
March 1981

A Method of Determining the Emission and Susceptibility Levels of Electrically Small Objects Using a TEM Cell

Ma, M. T.; Chang, D. C.; and Sreenivasiah, I.

NBS Tech. Note 1040
April 1981

Excitation of a TEM Cell by a Vertical Electric Hertzian Dipole

Ma, M. T.; Wilson, P. F.; and Chang, D. C.

NBS Tech. Note 1037
March 1981

Challenges of EMI Measurements

Miller, C. K. S.

Proc. NCSL Conf., Sep. 22-25, 1980
Oct. 1980

Synthesized Isotropic Pattern Antennas for EM Field Measurements

Reeve, G. R.

Symp. Record, "EMC '81," 1981 IEEE Int'l Symp. on Electromagnetic Compatibility, Boulder, CO, Aug. 18-20, 1981
Aug. 1981

A Frequency Tracking, Tuned, Receiving Monopole

Reeve, G. R. and Wainwright, A. E.

Record, IEEE/APS Symp.
June 1981

Influence of Electromagnetic Interference on Electronic Devices

Ries, F. X. and Miller, C. K. S.

Bulletin, OIML Seminar
Dec. 1981

A Critical Study of Emission and Susceptibility Levels of Electrically Small Objects from Tests Inside a TEM Cell

Sreenivasiah, I.; Chang, D. C.; and Ma, M. T.

Record, EMC '81 Symp.
Aug. 1981

Electromagnetic Interference (Cont'd)

Emission Characteristics of Electrically Small Radiating Sources from Tests Inside a TEM Cell

Sreenivasiah, I.; Chang, D. C.; and Ma, M. T.

IEEE Trans. EMC

Aug. 1981, Vol. EMC-23, No. 3

Characterization of Electrically Small Radiating Sources by Tests Inside a Transmission Line Cell

Sreenivasiah, I.; Chang, D. C.; and Ma, M. T.

NBS Tech. Note 1017

March 1980

Methods of Suppressing Automotive Interference

Taggart, H. E.

NBS Special Pub. 480-44

Nov. 1981

NBS 30/60 Megahertz Noise Measurement System Operation and Service Manual
Counas, G. J. and Bremer, T. H.
NBSIR 81-1656
Dec. 1981

Evaluation of Signal Plus Noise Detection Error in an Envelope Detector with
Logarithmic Compression
Estin, A. J. and Daywitt, W. C.
IEEE Trans. Info. Theory
Sep. 1981, Vol. IT-27, No. 5, pp 663-664

Evaluation of Signal Plus Noise Detection Error in an Envelope Detector with
Logarithmic Compression
Estin, A. J. and Daywitt, W. C.
NBSIR 79-1614 (R)
Aug. 1979

Addendum to Earth Terminal Measurement System Maintenance Manual
Wakefield, J. P.
NBSIR 81-1641
Oct. 1981

Properties of Materials

Dielectric Measurements in a Shielded Open Circuit Coaxial Line

Bussey, H. E.

IEEE Trans. Inst. and Meas.

June 1980, Vol. IM-29, No. 2

Active Microwave Water Equivalence Measurements

Ellerbruch, D. A. and Boyne, H. S.

Proc., Ft. Collins Snow Workshop

1980

A Temperature Probe for Radio-Frequency Heated Material

Bowman, R. R.

NBSIR 81-1634

Jan. 1981

Modeling of Oil Shale Retorts for Electromagnetic Sensing Techniques

Chew, H.

NBSIR 81-1653

Nov. 1981

Requirements for an Effective National Nonionizing Radiation Measurement System

Clark, H. E.

NBS Special Pub. 613

June 1981

A Wideband RF Voltage Comparator

Driver, L. D. and Ries, F. X.

Digest, 1980 CPEM Conf.

June 1980

HF Ground Wave Propagation over Mixed Land, Sea, and Sea-Ice Paths

Hill, D. A. and Wait, J. R.

IEEE Trans. on Geoscience and Remote Sensing

Oct. 1981, Vol. GE-19, No. 4, pp 210-216

HF Radio Wave Transmission over Sea Ice and Remote Sensing Possibilities

Hill, D. A. and Wait, J. R.

IEEE Trans. on Geoscience and Remote Sensing

Oct. 1981, Vol. GE-19, No. 4, pp 204-209

HF Ground Wave Propagation over Sea Ice for a Spherical Earth Model

Hill, D. A. and Wait, J. R.

IEEE Trans. on Ant. and Prop.

May 1981, Vol. AP-19, No. 3, pp 525-527

Electromagnetic Characteristics of a Coaxial Cable with Periodic Slots

Hill, D. A. and Wait, J. R.

IEEE Trans. on EMC

Nov. 1980, Vol. EMC-22, No. 4, pp 303-307

On the Excitation of the Zenneck Surface Wave Over the Ground at 10 MHz

Hill, D. A. and Wait, J. R.

Annales des Telecommunications

May-June 1980, Vol. 35, Nos. 5-6, pp 1-4

Ground Wave Attenuation Function for a Spherical Earth with Arbitrary Surface Impedance

Hill, D. A. and Wait, J. R.

Radio Science

May-June 1980, Vol. 15, No. 3, pp 637-643

Electromagnetic Theory of the Loosely Braided Coaxial Cable: Part II - Numerical Results

Hill, D. A. and Wait, J. R.
IEEE Trans. on MTT
April 1980, Vol. MTT-28, No. 4, pp 326-331

Propagation Along a Coaxial Cable with a Helical Shield

Hill, D. A. and Wait, J. R.
IEEE Trans. on MTT
Feb. 1980,, Vol. MTT-28, No. 2, pp 84-89

Evaluation of Three-Terminal and Four-Terminal Pair Capacitors at High Frequencies

Jones, R. N.
NBS Tech. Note 1024
Sep. 1980

Spherical Scanning Data Processing: An Algorithm for Halving the Data Processing Effort when the Radiation into the Back Hemisphere is Negligible

Lewis, R. L.
Digest, 1981 IEEE AP-S Int'l Symp.
June 1981

A Bibliography of Publications in the NBS Electromagnetic Fields Division

Miller, C. K. S.
NBSIR 80-1635
Nov. 1980

Fields of a Horizontal Loop of Arbitrary Shape Buried in a Two-Layer Earth

Wait, J. R. and Hill, D. A.
Radio Science
Sep.-Oct. 1980, Vol. 15, No. 5, pp 903-912

Addendum to Earth Terminal Measurement System Maintenance Manual

Wakefield, J. P.
NBSIR 81-1641
Oct. 1981

Laser Fluorescence Diagnostics of Lithium Vapor for Inertial Confinement Applications

Wyss, J. C.; Stwalley, W. C.; Koch, M. E.; and Verma, K. K.
Topical Meeting on Inertial Confinement Fusion, San Diego, CA
Feb. 26, 1980

A Delta-Distribution Derivation of the Electric Field in the Source Region

Yaghjian, A. D.
Digest, 1981 IEEE/AP-S Symp.
June 1981

Reply to Criticism on Electric Dyadic Functions in the Source Region

Yaghjian, A. D.

Proc., IEEE

Feb. 1981, Vol. 69, No. 2

Augmented Electric- and Magnetic-Field Integral Equations

Yaghjian, A. D.

Digest, Int'l URSI Symp. on EM Waves, Munich, Germany

Aug. 1980

Electric Dyadic Green's Functions in the Source Region

Yaghjian, A. D.

Proc., IEEE

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U.S. DEPT. OF COMM. BIBLIOGRAPHIC DATA SHEET (See instructions)	1. PUBLICATION OR REPORT NO. NBSIR 82-1673	2. Performing Organ. Report No.	3. Publication Date August 1982
4. TITLE AND SUBTITLE Bibliography of the NBS Electromagnetic Fields Division Publications			
5. AUTHOR(S) Edited by: Kathryn A. Gibson & Charles K. S. Miller (723.00)			
6. PERFORMING ORGANIZATION (If joint or other than NBS, see instructions) NATIONAL BUREAU OF STANDARDS DEPARTMENT OF COMMERCE WASHINGTON, D.C. 20234		7. Contract/Grant No.	8. Type of Report & Period Covered
9. SPONSORING ORGANIZATION NAME AND COMPLETE ADDRESS (Street, City, State, ZIP)			
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12. KEY WORDS (Six to twelve entries; alphabetical order; capitalize only proper names; and separate key words by semicolons) antennas; electromagnetic interference; em material properties; electromagnetic metrology; microwaves; noise; non-ionizing radiation; radiation hazards.			
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